$$
\begin{aligned}
& \text { Chapter 1: Real numbers } \\
& \text { - Pythagorean Theorem: } \begin{array}{l}
a^{2}+b^{2}=c^{2} \\
b^{2}=c^{2}-a^{2}
\end{array} \\
& \text { - Laws of Exponents: } \quad a^{1}=a \quad a^{-n}=\frac{1}{a^{n}} \\
& \begin{array}{ll}
a^{0}=1 & \frac{a^{m}}{a^{n}}=a^{m-n} \\
\left(a^{n} a^{m}\right)=a^{m+n} \\
\left(a^{n}\right)^{m}=a^{m \times n} & (a b)^{m}=a^{m} b^{m}
\end{array} \quad\left(\frac{a}{b}\right)^{m}=\frac{a^{m}}{b^{m}}
\end{aligned}
$$

- Scientific notation: a $\times 10^{n}$


## Chapter 4: Relations \& Functions

- Linear Function
$>y=a x+b ; \quad$ a: Rate of Change;
b: Initial value (or y-intercept)
$>$ Constant: $y=b ; \quad a=0$; horizontal line
$>$ Direct: $y=a x ; b=0$; line through origin
$>$ Partial: $\quad y=a x+b ; \quad$ line not thru origin
- System of linear equations
$>$ Solve for the point of intersection ( $\mathrm{x}, \mathrm{y}$ )
- Rational function
$>\mathrm{y}=\frac{k}{x} \quad$ Curve, never touches either axes.


## Chapter 3: Equations \& Inequalities

- Solving Equations (=)
>Keywords: same as, equal, equivalent,
$>$ Solve for the unknown variable
>There is one unique solution
- Solving Inequalities (<; < > ; $\geq$ )
$>$ Keywords: less than; less than or equal to(maximum); greater than(more); greater or equal to(minimum)
>There is an interval of possible solutions.


## Chapter 5: Solids

- Views of solids:
$>$ Top, Bottom, Left, Right, Front, Back
- Perspectives:
> Oblique
- Axonometric
$>$ Linear.

| $\quad$ Chapter $5:$ Solids |
| :--- |
| • Views of solids: |
| $>$ Top, Bottom, Left, Right, Front, Back |
|  |
| - Perspectives: |
| $>$ Oblique |
| $>$ Axonometric |
| $>$ Linear. |

## Chapter 8: Probability

## - Basic counting principle

$>$ Permutation ( with/without repetition)
$>$ Combination (with/without repetition)

- Probability of events
> Prob $=$ \# of desired outcomes
- Geometric Probability
$>1 \mathrm{D} \quad \mathrm{P}($ Target $)=\frac{\text { Target length }}{\text { Total lengt }}$
Total length
$>2 \mathrm{D} P($ Target $)=\frac{\text { Target area }}{\text { Total area }}$
$>3 \mathrm{D} \quad \mathrm{P}$ (Target) $=\frac{\text { Target volume }}{\text { Total volume }}$


## Chapter 6: Area and Volume of Solids

- Areas and Volumes of solids $>$ Cube, Prism, Cylinder, Cone, Pyramid,
Sphere
Areas and Volume of decomposable solids
- Areas and Volume of decomposable solids
- Finding the missing measure
- Conversion charts


## Chapter 7: Isometry and Similitude

- When two solids are similar
> The ratio of their sides is K
$>$ Sides of the larger solid are $K$ times bigger than the smaller one.
$>$ The ratio of their areas is $\mathrm{K}^{2}$
$>$ Area of the larger solid is $\mathrm{K}^{2}$ times bigger than the smaller one
$>$ The ratio of their volumes is $\mathrm{k}^{3}$
$>$ Volume of the larger solid is $\mathrm{k}^{3}$ times bigger than the smaller one.


## Chapter 2: Algebraic Expressions

- Polynomials: Monomials, Binomials, Trinomials
- Vocabulary: Coefficient, like terms, degree $3 x^{7}$
- Adding/Subtracting polynomials
> Group like terms only
$>$ Exponents don't change
- Multiplying/Dividing polynomials
> Add/subtract exponents of terms with same base
> FOIL: multiplying 2 binomials
- Common factor .

